Tulina, Yu.V.

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S/011/61/000/001/001/001
A054/A133

AUTHORS: Veytsman, P.S.; Gal'perin, Ye.I.; Zverev, S.M.; Kosminskaya, I.
            P.; Krakshina, R.M.; Mikhota, G.G. and Tulina, Yu.V.

TITLE: Some results of studying the Earth's crust in the area of the Kuril
            Island arc and the adjoining areas of the Pacific Ocean based on
            deep seismic sounding data

PERIODICAL: Izvestiya Akademii Nauk, SSSR. Seriya geologicheskaya, no.1, 1961,
            81 - 66

TEXT: In 1957-58, Soviet geologists surveyed by deep seismic sounding the
geology of the region between the Asiatic continent and the Pacific, the area of
the Kuril Island arc and surrounding parts of the Pacific. These latter regions
are particularly interesting, because in a rather narrow (300 - 400, km) zone the
Earth's crust here shows great variations which can be classified in three main
groups: 1) continental type crust, consisting of an upper sedimentary and two
lower: a granite and a basalt layer. This zone is 20-30 km thick, the average
velocity of longitudinal waves in this zone is not more than 6 km/sec. 2) The
oceanic part of the crust consists of a thin sedimentary less than 1 km thick and

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Some results of studying the Earth's crust ...   S/011/61/000/001/001/001
                                                        A053/A133

a 5 - 10 km thick basalt layer. The wave velocity in this zone (outside the
sedimentary layer) is about 7 km/sec. 3) The intermediate zone has an intermediate
character both as regards thickness and structure of its layers (in general the
sedimentary-basalt structure prevails). The classification into these three groups
was based on the time-distance curves of primary waves and the ratio of average
speed v to depth h. The geological map of the surveyed area shows that the
intricate alternation of these three types of crust-structure cannot be observed
in the direction from the island to the ocean only but also along the entire area,
from the Hokkaido Island to the Peninsula of Kamchatka. The most intricate crust-
structure is found in the area between the island arc and the Kurile-Kamchatka
deep trench. According to the crust-structure this area can also be divided into
three parts: a) its northern part shows a continental, b) its southern part part-
ly a continental, partly an intermediate character, while c) the central part also
consists of two structures: one of an intermediate and one of an oceanic character
and seems to be the continuation of the deep-water area of the Okhot Sea. In order
to establish the changes in propagation velocity in the transition zone of one
typical area of the crust into another, the average $\bar{V}$-values have been determined
at a height of 7 km from the bottom. The comparison of the velocity curves with
the relief of the bottom revealed a strict regularity in the relations: the oceanic

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Some results of studying the Earth's crust ...   S/011/61/000/001/001/001
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plateau corresponds to the highest average values of $\bar{V}$, which drop sharply in the direction from the oceanic plateau to the tabular zone, in northern and southern direction as well, in the area of the eastern slope of the deep trench. The lower values of $\bar{V}$ in the tabular zone are connected with thick sedimentary layers, (near Kamchatka). The areas close to the central and the southern part of the arc display high V values and the high $\bar{V}$-values for the oceanic plateau show a stable character (about 7 km/sec). Between the island arc and the deep trench however, there are also extensive low-water areas. When comparing the bathymetric data referring to this area and the structure of the crust it can be established that the low-water areas of the Pacific at the northern and southern regions of the arc correspond to the continental type of the crust, whereas the deep-water areas of the central part of the island arc correspond to the intermediate type of the Earth's crust. The same regularity is also observed for the western coast of the island arc. Gravimetric data show that in regions of the continental type crust structure the anomalies of the gravity force display low values as compared with those registered for the ocean, while in the zones of intermediate crust structure the anomalies also have medium values between oceanic and continental anomalies. The boundaries between the zones of various Δg values correspond roughly to the boundaries between the zones of various crust-

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structures. The most intense volcanic activity for the past 200 years was record-
ed for the central part of the arc, with an intermediate crust-structure, while
the highest seismic activity was observed in areas with a continental type struc-
ture of the core. In the Kuril arc remarkable and intensive recent movements
have been observed, according to which the area can again be divided into three
part: in the northern and southern parts a remarkable up-lift is established,
whereas the central part - bordered by the Bussol' and Kruzenshtern straits has
subsided. There are 4 figures and 9 Soviet-bloc references.

ASSOCIATION: Institut fiziki Zemli AN SSSR, Moskva (Institute of Geophysics, AN
                USSR, Moscow)

Card 4/4

KOSMINSKAYA, I.P.; ZVEREV, S.M.; VEYTSMAN, P.S.; TULINA, Yu.V.;
    KRAKSHINA, R.M.

Basic features of the structure of the earth's crust under the
Sea of Okhotsk and the Kurile-Kamchatka zone of the Pacific Ocean,
based on deep seismic sounding data; results of the IGY. Izv. AN
SSSR, Ser.geofiz. no.1:20-41 Ja '63.   (MIRA 16:2)

1. Institut fiziki Zemli AN SSSR.
    (Soviet Far East—Submarine geology) (Seismology)

L 13841-66   EWT(1)/EWA(h)   GW
ACC NR: AR6000815

SOURCE CODE: UR/0169/65/000/009/G022/G022

SOURCE: Ref. zh. Geofizika, Abs. 9G187

AUTHOR: Mikhota, G. G.; Tulina, Yu. V.

TITLE: Experiments in grouping well shafts in deep seismic sounding operations

CITED SOURCE: Sb. Vopr. metodiki glubin. seysmich. zondirovaniya. M., Nauka, 1965, 40-50

TOPIC TAGS: seismic prospecting, explosive charge, underground explosion

TRANSLATION: The authors studied the effect which the distance between well shafts in a group of 3 and 7 wells has on the intensity of waves in deep seismic sounding. The weight of the grouped charge was 350 and 700 kg of TNT, the distance between wells was taken as 5, 10, 15, 20 and 25 m, and recording was done at a distance of 39 and 65 km from the blasting point. No clear relationship was observed between the frequency spectra and the parameters of the group during the experiment. It is pointed out (as in other seismic prospecting observations) that there is an optimum distance between explosions in a grouped blast, where the seismic effect is a

UDC: 550.834

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ACC NR: AR6000815

maximum. The reduction in efficiency at short distances is due to an additional loss of energy in distortion where the zones of plastic deformation for the individual charges overlap. It is possible that a reduction in the intensity at distances greater than the optimum is due to a change in the characteristics of directivity of the source. The optimum distance depends basically on the size of an individual charge in the group and to a lesser degree on the lithology of the surrounding rock. These experiments showed an optimum distance of 15-20 m for an individual charge of 50 kg and a distance of 20-30 m for an individual charge of 100 kg.

SUB CODE: 08

Card 2/2

ACC NR: AT6010298   SOURCE CODE: UR/3195/65/000/006/0060/0065

AUTHOR: Gaynanov, A. G.; Tulina, Yu. V.; Kosminskaya, I. P., Zverev, S. M.;
Veytsman, P. S.; Solov'yev, O. N.

ORG: none

TITLE: Comprehensive interpretation of data from geophysical observations in the
Sea of Okhotsk and the Kurile-Kamchatka zone of the Pacific Ocean

SOURCE: AN SSSR. Mezhduvedomstvennyy geofizicheskiy komitet. Seysmicheskiye
issledovaniya, no. 6, 1965, 60-65

TOPIC TAGS: seismology, gravimetry, geomagnetism, deep seismic sounding, geophysical
anomaly, transition zone

ABSTRACT: Data on the earth's crust acquired during the IGY from geological and
geophysical studies (by magnetic, gravimetric, and seismic methods) in the transi-
tional zone between Asia and the Pacific Ocean were used to investigate two problems:
1) qualitative comparison of special features of anomalous gravitational and magnetic
fields with structures of the earth's crust determined by seismic data (deep seismic
sounding); and 2) some results from a quantitative comparison of gravitational and
magnetic anomalies with deep seismic-sounding data. A map of magnetic anomalies
shows moderate isometric anomalies in the Sea of Okhotsk and pronounced anomalies
in narrow belts in the Sea of Okhotsk, along the Kurile-Kamchatka ridge and adjacent

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L 21427-66

ACC NR: AT6010298

parts of the Pacific, and near the Komandorskiye Islands. The sources of magnetic anomalies in the North Okhotsk and Sakhalin depressions seem to be confined to the uppermost or lowermost portions of the "granitic" layer and the upper part of the "basaltic" layer. In areas in the Pacific off the Kurile Islands, the anomalies are in the uppermost part of the mantle, and east of the deep offshore trench, they are in the upper mantle and the "basaltic" layer. It can be assumed that these magnetic anomalies are caused by processes associated with the formation of discontinuities and lava intrusions from the upper mantle onto the ocean floor. Comparisons of the anomalous gravitational field with deep seismic-sounding data showed that the principal features of the field coincide with the structures in the crust indicated by the sounding data thus making it possible to identify regions of anomalous density. Orig. art. has: 4 figures.   [EO]

SUB CODE: 08/ SUBM DATE: none/ ATD PRESS: 4221

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GAYNANOV, A.C.; TULINA, Yu.V.; KOSMINSKAYA, I.P.; ZVEREV, S.M.; VEYTSMAN,
    P.S.; SOLOV'YEV, O.N.

    Complex interpretation of the materials on geophysical
    observations in the Sea of Okhotsk and Kurilo-Kamchatka zone
    of the Pacific Ocean. Seism. issl. no.6:60-65 '65.
                                            (MIRA 18:9)

VEYTSMAN, P.S.

TULINA, YU. V.

L.31816-65 EWT(1)/EWA(h) Pob GW

AM5045250   BOOK EXPLOITATION   S/   30
15
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Akademiya nauk SSSR. Institut fiziki zemli im. O. Yu. Shmidta

Structure of the earth's crust in the zone of transition from the continent of
Asia to the Pacific Ocean (Stroyeniye zemnoy kory v oblasti perekhoda ot Asi-
atskogo kontinenta k Tikhomu Okeanu) Moscow, Izd-vo "Nauka", 1964. 307 p.
illus., biblio., foldin charts (in portfolio). Errata slip inserted. 1200
copies printed. Responsible editors: Yo. I. Gal'perin, L. P. Kosminskaya;
Editor of publishing house: S. I. Masarskiy; Technical editors: Ye V.
Makuni, S. G. Tikhomirova

TOPIC TAGS: area seismic sounding, earth crust, geophysics, international geophy-
sical year, ocean, seismic wave

PURPOSE AND COVERAGE: This monograph is devoted to studies by the method of deep
seismic sounding (DSS) in the zone of transition from the Asiatic continent to
the Pacific Ocean (Kamchatka, the Kurile peninsula, Bering Sea, etc.) during the
International Geophysical Year (IGG). The material is presented as a collection
of individual chapters, although all are devoted to a single problem and are

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essentially parts of one book. The authors express their gratitude to Professor
V. V. Fodynskiy, Chairman of the working subgroup of the Sovetskiy Natsional'nyy
Komitet, initiator and organiser of complex geophysical research, and also to
Corresponding Member of the Academy of Sciences of the USSR V. V. Belousov.
The concluding chapter was prepared by A. G. Aver'yanov, P. S. Veytsman, Ye. I.
Gal'perin, S. M. Zverev, and I. P. Kosminskaya.

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Tulinov, A.F.

INSTRUMENTATION: CHANNEL ANALYZERS

The electrostatic analyzer used in nuclear physics, and employing circular particle trajectories, has a serious shortcoming in that double focusing is impossible. This article indicates the possibility of using a helical particle trajectory, moving in the field of a cylindrical capacitor, and capable of double focusing.

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56-6-38/56

AUTHOR   TULINOV, A.F.

TITLE   On a Method for the Measuring of the Life of the Excited States
             of Atomic Nuclei.
             (Ob odnom metode izmereniya vremeni zhizni vozbuzhdennykh sosto-
             yaniy atomnykh yader -Russian)

PERIODICAL   Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol 32, Nr 6, pp 1568-1570
             (U.S.S.R.)

ABSTRACT   The present paper discusses the applicability of a new method for
             the measuring of the Life τ of the excited states of light nuclei
             within the range of values of $10^{-12} - 10^{-14}$ sec. The author here
             investigates a nuclear reaction which takes place in a thin target
             under the effect of a bundle of monoenergetic particles. The coun-
             ters which are set to coincidence are assumed to detect both com-
             ponents (the light component and the recoil nucleus). If the direc-
             tion of the emission of the light component is fixed and if the ang-
             ular distribution of the recoil nuclei corresponding to this light
             component are recorded, a system of peaks is obtained. Each of these
             peaks refers to a certain energy level of the nuclei in the end
             state. The nuclei corresponding to the excited states will, in ge-
             neral, be broad. By comparing the shapes of peaks with and without
             a slowing down layer, it is possible to obtain data concerning the
             value of τ.
             For the determination of quantitative relations such a case is stu-

Card 1/2   died here in which the recoil nucleus, which develops in an excited

On a Method for the Measuring of the Life of the Excited
States of Atomic Nuclei.

56-6-38/56

state, goes over into the ground state while emitting a γ-quantum
with the energy $E\gamma$. Emission is here approximatively described as
isotropic. Several further simplified conditions are given. In a thin
target without a slowing-down layer the angular distribution of the
recoil nuclei relating to the excited state under investigation is
of rectangular shape with a total breadth of $\Gamma_1 = 2p\gamma/p_n$. Here
$p\gamma$ and p_n denote the momenta of the γ-quantum and the recoil nuc-
leus respectively. If a layer of material of the thickness is pla-
ced immediately behind the target, the entire angular distribution
consists of the two parts I and II. Part I is caused by these nuc-
lei the illumination of which occurs within the slowing-down layer,
and part II is formed after passage through the layer. For the an-
gular distribution of the recoil nuclei a formula is given.
(2 illustrations)

ASSOCIATION   Moscow State University.
PRESENTED BY
SUBMITTED   17.2.1957
AVAILABLE   Library of Congress.
Card 2/2

21(7)

AUTHORS: Boyarkina, A. N., Tulinov, A. F.   SOV/56-36-2-2/63

TITLE: Determination of the Lifetime of the First Excited State of the
              Be^{10} Nucleus (Opredeleniye vremeni zhizni pervogo vozbuzhdennogo
              sostoyaniya yadra Be^{10})

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959,
              Vol 36, Nr 2, pp 353-361 (USSR)

ABSTRACT: Measuring of lifetimes $< 10^{-10}$ sec is rendered possible by
              various indirect methods which, however, all have a very small
              range of applicability. Though this is not the case with the
              "Doppler-shift" method, its application nevertheless causes
              considerable technical difficulties. Tulinov therefore developed
              another method (Ref 1), for the determination of the lifetimes of
              the excited states of light nuclei, which, compared to the
              Doppler-shift method, has the same range of applicability but
              causes less technical difficulty. The present paper first
              describes this method and later the results obtained by the
              lifetimes measurements carried out with it. The method is based
              on the experimental determination of the recoil nuclei ratio for
Card 1/4   two different positions of the target. The target itself consists

Determination of the Lifetime
of the First Excited State of the Be^{10} Nucleus   SOV/56-36-2-2/63

of a beryllium layer on aluminum backing; at a small distance
from the beryllium layer and in front of it there is a
compensation layer. The incident beam (deuterons) impinges,
after penetrating the backing (position A), upon the beryllium
layer, and the light particles penetrating the compensation
layer as well as the recoil nuclei are recorded. Position B is
attained if the device is turned by an angle of 180°. From the
ratio δ = number of recoil nuclei recorded in position B:
number of recoil nuclei recorded in position A, it is possible
to determine the lifetime τ. The authors employed this method for
the purpose of determining the τ of the first excited level of
Be^{10} from the reaction $Be^{9}(d, p)Be^{10}$, which has hitherto
not been determined. Measurements were carried out on a 4 Mev
deuteron beam of the cyclotron of the NIIYaF MGU (Scientific
Research Institute for Nuclear Physics of Moscow State
University). Within the range of the target the beam had a

diameter of 6 mm with an intensity $\sim 10^{-7}$ A. The emitted
protons were recorded by proportionality counters, the recoil
Card 2/4   nuclei by counters with electronic amplification.

Determination of the Lifetime
of the First Excited State of the Be^{10} Nucleus   SOV/56-36-2-2/63

δ was determined as amounting to 0.93 ± 0.08, which results in $\tau < 8.10^{-14}$ sec. The theoretical determination of τ for the first excited state of Be^{10}(3.37 Mev) with the spin $J=2$ and the isotopic spin $T=1$, the ground state $-J=0$, $T=1$ results in $\tau = 6.58.10^{-16}/\Gamma$ where Γ denotes the breadth of the excited level in ev; (τ in seconds). For the E2-transition it holds that $\Gamma = 8.1.10^{-5}E^5 |< JT \| H^{(2)} \| J'T' >|^2$; E = transition energy in Mev, $< JT \| H^{(2)} \| J'T' >$ the matrix element of electrical quadrupole transition from state J, T to the state J', T' . Thus, τ is equal to $2.1.10^{-13}$ sec. Also for other nuclei (C^{12}, B^{10}) theoretical τ-values are higher than those obtained experimentally.

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Determination of the Lifetime
of the First Excited State of the Be^{10} Nucleus

SOV/56-36-2-2/63

The authors finally thank S. S. Vasil'yev and V. G. Neudachin
for discussions and they express their gratitude to the
collaborators of the cyclotron team Yu. V. Koshelyayev,
A. A. Danilov, and V. P. Khlapov for their assistance. There
are 7 figures, 1 table, and 17 references, 9 of which are Soviet.

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo
               universiteta (Institute of Nuclear Physics of Moscow State
               University)

SUBMITTED: June 27, 1958

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21(8)
AUTHORS:

SOV/56-36-2-41/63

Balashov, V. V., Tulinov, A. F.

TITLE:

On the Problem of Collective Effects in Light Nuclei (K vopr.-su o kollektivnykh effektakh v legkikh yadrakh)

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 2, pp 615 - 616 (USSR)

ABSTRACT:

It is interesting to discuss some general considerations concerning the collective effects in nuclei which are not connected with the concretization of the mechanism of collective intensification of the electric quadrupole transitions and, therefore, with the addition of any further parameters. In contrast to the one particle operator, the operator of the quadrupole transition (which is connected with a collective motion) contains only a scalar component with respect to isotopic spin. There are therefore no collective effects in the E2 transitions with exchange of the isotopic spin, and it may be assumed, that the shell theory will give the correct values of the probabilities of these transitions. The verification of this statement is especially interesting in the region of light nuclei. Within the

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On the Problem of Collective Effects in Light Nuclei   SO7/56-36-2-41/63

p-shell, only a small number of pure E2-transitions with variation of the isotopic spin can be observed. The increase of the probability of the quadrupole transitions found is due to collective effects and such effects are actually excluded in transitions with variation of isotopic spin. Unfortunately, experimental data are available only for the case $16.1(C^{12})$. Finally, the authors suggest the following experimental investigations: a) Measurement of the time τ for the transitions $3.58 \rightarrow 1.74$ Mev and $4.77 \rightarrow 1.74$ Mev in B^{10}. This can be carried out either according by the method of the Doppler shift (for example, in the reaction $C^{12}(d,\alpha)B^{10}$) or by measuring the relative probabilities of the transitions from the states 3.58 and 4.77 Mev to the lower states. b) Measurement of the relative probabilities in the mixed M1+E2 transitions, especially in the transition $17.63 \rightarrow 2.9$ Mev in the Be^{8} nucleus. There are 1 table and 12 references, 2 of which are Soviet.

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta (Institute of Nuclear Physics of Moscow State University)

SUBMITTED: June 27, 1958
Card 2/2

BOYARKINA, A.N.; TULINOV, A.F.

Determining the lifetime of the first excited state of the
Be^{10} nucleus. Zhur.eksp. i teor.fiz. 36 no.2:351-361 F '59.
(MIRA 12:4)

1. Institut yadernoy fiziki Moskovskogo gosudarstvennogo
universiteta.
(Beryllium--Isotopes)

21(7)
AUTHORS: Neudachin, V. G., Teplov, I. B., Tulinov, A. F.

TITLE: On the Use of (d,p)-Reactions for the Excitation of States With
               Large Spins

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959,
               Vol 37, Nr 2(8), pp 548-550 (USSR)

ABSTRACT: Gol'danskiy suggested that the inelastic scattering of complex
               nuclei be used for the excitation of nuclear moments with large
               spins; the authors of the present "Letter to the Editor" show,
               on the other hand, that in the case of light nuclei the same
               may be attained by using the (d,p) function. For the ordinary
               stripping process $\vec{J}_i + \vec{J}_n = \vec{J}_f$, $(\Delta J)_{max} = j$ holds, where
               $\vec{J}_i$ and $\vec{J}_f$ are the spins of the initial and final states re-
               spectively, j_n - the total angular momentum of the captured
               nucleon. Ordinary stripping is forbidden unless this condition
               is satisfied. In such a case, spin-flip- or knock-out processes
               with the condition $\vec{J}_i + \vec{J}_{p_1} + \vec{J}_{n_1} = \vec{J}_f + \vec{J}_{p_2}$, $(\Delta J)_{max} = 3j$ oc-

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SOV/56-37-2-33/56

On the Use of (d,p)-Reactions for the Excitation of States With Large Spins

cur; the indices p and n denote proton and neutron respectively in the inciding deuteron, p_2 - the departing proton. It may be seen from the equations that in a knock-out process the difference in the spins may, from the initial to the final state ΔJ, attain a much higher value than in the case of the ordinary stripping process. In order to illustrate these conditions, the authors carried out a calculation of the proton angular distribution in the knock-out process $B^{10}(d,p)B^{11*}$ (E_{exc} = 2.14 Mev, $J = 1/2^-$), for which the ordinary stripping process is forbidden. The calculation was carried out for the energies E_d = 4, 8, and 12 Mev (R = $4.8.10^{-13}$ cm). Results are shown by figure 1 and are compared with Butler's curves. It was found that for all energies the maximum of the curves for the ordinary stripping process is narrower than for the knock-out process. For spin-flip the condition $\vec{J}_1 + \vec{J}_n + \vec{s}_p + \vec{s}_p = \vec{J}_f$, $(\Delta J)_{max} = j + 1$ holds ($\vec{s}_p$ - proton spin). The angular distribution for this

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On the Use of (d,p)-Reactions for the Excitation of States With Large Spins   SOV/56-37-2-33/56

process also deviates from that of the ordinary stripping process. The knock-out and the spin-flip process in the (d,p)-reaction are considerably more sensitive to the nuclear Coulomb field, and as, besides, for the excitation of states with large spins the orbital moments of deuterons, which are different from zero, play the principal part, it is best to use deuterons with energies that are several times higher than the Coulomb barrier, e.g. $E_d \gtrsim 15$ Mev for $Z \sim 12$, $E_d \gtrsim 8$ Mev for $Z \sim 5$. At lower energies the peak again becomes flatter. These conditions are explained on the basis of the reaction $Mg^{24}(d,p)Mg^{25*}$ $(E_{exc} = 1.61$ Mev, $J^* = 7/2^+)$ at 8 Mev (Ref 11). Figure 5 shows the angular distribution of protons from this process. There are 2 figures and 13 references, 4 of which are Soviet.

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta (Institute of Nuclear Physics of Moscow State University)

SUBMITTED: May 8, 1959
Card 3/3

BEDNYAKOV, A.A.; BOYARKINA, A.N.; SAVENKO, I.A.; TULINOV, A.F.

Multiple scattering of 100 - 200 Kev. protons on carbon. Zhur.eksp.
i teor.fiz. 42 no.3:740-746 Mr '62.   (MIRA 15:4)

1. Institut yadernoy fiziki Moskovskogo gosudarstvennogo
universiteta.
            (Protons--Scattering)   (Carbon)

BALASHOV, V.V.; TULINOV, A.F.

Giant resonance of spin wave excitation in atomic nuclei. Zhur.
eksp. i teor. fiz. 43 no.2:702-705 Ag '62. (MIRA 16:6)

1. Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta.
(Protons--Scattering) (Nuclei, Atomic)

S/120/62/000/006/005/029
E032/E114

AUTHORS: Bednyakov, A.A., Boyarkina, A.N, Savenko, I.A., and
Tulinov, A.F.

TITLE: A study of the multiple scattering of protons by the
photographic method

PERIODICAL: Pribory i tekhnika eksperimenta, no.6, 1962, 35-40

TEXT: A highly collimated proton beam from a 300 kV
electrostatic generator at the NIlYaF MGU was passed through an
analysing magnet in which it was deflected through $90°$ and then
entered a polystyrene film of a few tens of micrograms per cm^2.
The film was set up at right angles to the beam and the protons
transmitted by it were   recorded by nuclear emulsions of type MK
(7 μ thick). The image recorded in the photographic plate was
then examined photometrically, and the results of this examination
were used to deduce the required angular distribution of the
scattered protons.   The possibilities of the method are indicated
by Fig.7 in which the angular distribution of 162.5 keV protons
is shown for films of 24, 40 and 69 $μg/cm^2$. The continuous curves
were computed from Moliere's multiple scattering theory

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A study of the multiple scattering...   S/120/62/000/006/005/029
E032/E114

(G. Moliere, Z. Naturforsch. a, 3a, 1948, 78), using a carbon atom
potential computed by the Hartree-Fok method.   A more detailed
account of the results is reported elsewhere by the present
authors (Zh. eksperim. i teor. fiz., v.42, no.3, 1962, 740).
There are 7 figures.

ASSOCIATION: Nauchno-issledovatel'skiy institut yadernoy fiziki MGU
             (Scientific Research Institute of Nuclear Physics,
             MGU)

SUBMITTED: January 26, 1962)

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S/056/62/043/002/046/053
B108/B102

AUTHORS: Balashov, V. V., Tulinov, A. F.

TITLE: Giant resonance of spin wave excitation in atomic nuclei

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43,
              no. 2(8), 1962, 702-705

TEXT: In inelastic scattering of fast protons from light nuclei a
characteristic peak similar to the giant resonance peak in photoabsorption
has been observed. The fundamental properties of the collective spin
wave excitations causing such resonance have been studied. Besides, also
an optical giant resonance appears. The giant resonance of nuclear spin
wave excitation is more smeared out than the optical resonance. This
gives some insight into why the width of the inelastic scattering peak
is usually greater than the width of the photoabsorption curve. There
are 2 tables.

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo
              universiteta (Institute of Nuclear Physics of Moscow State
              University)

Card 1/2

Giant resonance of spin wave ...

S/056/62/043/002/046/053
B108/B102

SUBMITTED: March 31, 1962

Card 2/2

AKISHIN, A.I.; VASIL'YEV, S.S.; TULINOV, A.F.; TSEPLYAYEV, L.I.

Recording of neutral atoms having an energy of 50 - 500 ev. Izv.
AN SSSR. Ser. fiz. 28 no.1:138-140 Ja '64.   (MIRA 17:1)

ACCESSION NR: AP4037608   S/0056/64/046/005/1901/1903

AUTHORS: Bednyakov, A. A.; Dvoretskiy, V. N.; Savenko, I. A.;
Tulinov, A. F.

TITLE: Multiple scattering of protons with energy 75--200 keV in
solid substances

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 5, 1964, 1901-1903

TOPIC TAGS: copper, aluminum, polystyrene, proton scattering,
angular distribution, charge exchange

ABSTRACT: The study of multiple scattering of low energy heavy
charged particles, which was started by the authors with carbon
(ZhETF v. 42, 740, 1962) was continued with substances of higher Z.
The angular distributions of protons scattered by thin foils of
aluminum and copper were measured using nuclear emulsions mounted per-
pendicular to the beam axis. The measurement procedure was improved

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ACCESSION NR: AP4037608

somewhat by using an electrostatic analyzer behind the scattering chamber to determine the proton energy before and after penetration of the target. The measurement data were used both in the theoretical analysis of the obtained results and as a means of checking the target thickness. The angular distributions of the multiply scattered protons were obtained for a set of copper foils 190--530 $\mu g/cm^2$ thick in the initial energy range E_0 = 193--93 keV and for aluminum foils 52, 82, and 183 $\mu g/cm^2$ thick in the range E_0 = 184--75 keV.

Measurements were also made with polystyrene targets (46 and 82 $\mu g/cm^2$) to obtain more accurate data for carbon at energies less than 100 keV. The results for copper and aluminum were analyzed on the basis of the Bethe theory. The theoretical calculations are found to be in fairly good agreement with the experimental data for practically all proton energies and target thicknesses, even in the multiple scattering region. The agreement is somewhat surprising since no allowance was made for charge exchange, which is consider-

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ACCESSION NR: AP4037608

able at low energies. Orig. art. has: 2 figures.

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta (Nuclear Physics Institute, Moscow State University)

SUBMITTED: 27Jul63   DATE ACQ: 09Jun64   ENCL: 01

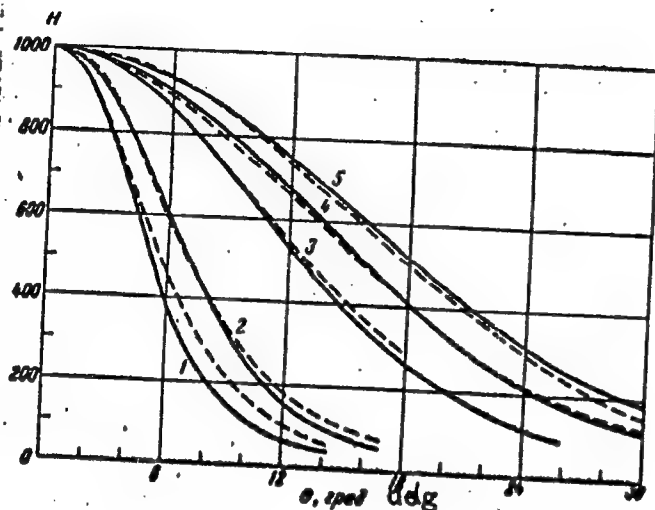SUB CODE: NP   NR REF SOV: 001   OTHER: 001

Card 3/4

Angular distribution for
copper: dashed curves are
experimental and continuous
curves are theoretical. The
different curves pertain to
different thicknesses and
initial energies

Card 4/4

L 1434-66   ENT(1)/ENT(m)/T/EWP(t)/EWP(b)/EWA(c)   DIAAP/IJP(c)   JD/GG

AUTHOR: Tulinov, A. F.; Akhmetova, B. G.; Puzanov, A. A.; Bednyakov, A. A.

TITLE: New method of investigating the properties of single crystals

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 2, no. 1, 1965, 48-50, and bottom half of insert A at rear of journal

TOPIC TAGS: proton scattering, nuclear reaction, crystal lattice structure

ABSTRACT: The method makes use of an effect, observed by one of the authors earlier (Tulinov, Dokl. AN SSSR v. 162, no. 3, 1965 and others), wherein the angular distribution of the charged-nuclear reaction products from single crystals become distorted by additional scattering of the product particles by the nuclei contained in chains corresponding to definite crystallographic axes in the crystal, and can accordingly be observed near these directions. Since earlier experiments on this effect were restricted to a single crystallographic axis, the authors recorded the effect produced simultaneously by a whole set of axes, to produce a proton plot of the crystal and to obtain information concerning its properties. The experiment was carried out with a beam of 500-kev protons from the cascade generator of NIIYaF MGU (Nuclear Physics Institute of the Moscow State University). The protons were

Card 1/3

L 1434-66

ACCESSION NR: AP5021151

incident on the surface of a thick molybdenum single crystal. The crystal [100] axis made an angle of 150° with the direction of the incident beam. The beam diameter did not exceed ~ 0.3 mm. The elastically scattered protons were registered with a photographic plate mounted perpendicular to the [100] axis. The image obtained in this manner displayed the lines where the crystallographic planes intersected the emulsion surface. These agreed well with the theoretical scheme of such lines for a body-centered lattice in the case when the [100] axis is directed perpendicular to the plane of the figure. Analogous measurements, made with different crystals at varying incident-particle energies and at varying thicknesses of the absorbers in front of the emulsion show that there are great possibilities for vary-. ing the "degree of density" of the proton pattern, i.e., of including or excluding tracks connected with the planes of relatively high indices. Since the proton wavelength is small, so that the wave properties of the beam exert little influence on the structure of the lines, their study can yield in many cases more useful information on the character of motion of the nuclei in the crystal lattice than methods which essentially use the wave properties of the radiation. Orig. art. has: 2 figures.   [02]

ASSOCIATION: Nauchno-issledovatel'skiy institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta (Nuclear Physics Research Institute, Moscow State University) 44,55

Card 2/3

L 1434-66

ACCESSION NR: AP5021151

SUBMITTED: 26May65   ENCL: 00   SUB CODE: SS, NP

NO REF SOV: 002   OTHER: 001   ATD PRESS: 4108

Card 3/3

L 4377-66   EWT(m)/EWA(h)
ACCESSION NR: AP5020255   UR/0367/65/002/001/0064/0069

AUTHORS: Melikov, Yu. V.;   Tulinov, A. F.

TITLE: The $C^{12}(d,\alpha)B^{10}$ reaction as a nucleon-cluster replacement process

SOURCE: Yadernaya fizika, v. 2, no. 1, 1965, 64-69

TOPIC TAGS: alpha particle reaction, carbon, deuteron bombardment, differential cross section

ABSTRACT: The angular distributions of the α particles from the reaction $C^2(D,\alpha)B^{10}$, corresponding to the production of the final nucleus in the ground state and in three excited states, have been measured for 13-MeV deuterons.   The experimental results are analyzed on the basis of a nucleon-cluster mechanism based on the shell model with intermediate coupling, using the plane-wave Born approximation.   The deuterons were accelerated to 13 MeV in the 120 cm cyclotron of NIIYaF MGU (Scientific Research Institute of Nuclear Physics, Moscow

Card   1/3

L 4377-66
ACCESSION NR : AP5020255

State University). A carbon target 75 $\mu g/cm^2$ thick was used. The
α particles were detected with silicon detectors of the surface-barrier
type, which were located 110 mm from the target and could be rotated
about an axis passing   through the center of the reaction chamber.
The experimental results obtained for two levels of the final nucleus
and are analyzed from the point of view of the nucleon-cluster re-
placement mechanism, under the assumption that the plane-wave Born
approximation is used, that the particles interact like points con-
centrated at the surface of the nucleus, and that the states of the
initial and final nuclei are described in terms of the shell model
with intermediate coupling. The influence of the excited states of
the Be^8 core on the differential cross section is considered, and the
experimental data on the $C^2(d,\alpha)B^{10}$ reaction at higher deuteron ener-
gies are theoretically analyzed. The assumption that the nucleon-
cluster replacement mechanism makes an important contribution to the
reaction in question is found to be consistent with the experimental
data. 'The authors thank G. A. Iferov and Yu. M. Plets for assist-
ance.' Orig. art. has: 7 figures and 1 formula.

L 4377-66
ACCESSION NR: AP5020255

ASSOCIATION: Nauchno-issledovatel'ski institut yadernoy fiziki
Moskovskogo gosudarstennogo universiteta (Scientific Research Insti-
tute of Nuclear Physics of the Moscow State University)

SUBMITTED: 18Feb65   ENCL: 00   SUB CODE: NP

NR REF SOV: 003   OTHER: 001

Card 3/3

DOLINOV, V.K.; MELIKOV, Yu.V.; TULINOV, A.F.

Angular distributions of alpha particles from the reactions $C^{12}(d,\alpha)B^{10}$ and $O^{16}(d,\alpha)N^{14}$. Pis'. v red. Zhur. eksper. i teoret.fiz. 2 no.3:120-122 Ag '65.

(MIRA 18:12)

1. Nauchno-issledovatel'skiy institut yadernoy fiziki i Moskovskogo gosudarstvennogo universiteta imeni Lomonosova. Submitted June 4, 1965.

L 00070-66   EWT(m)/T/EWA(h)   IJP(c)

ACCESSION NR: AP5021329

UR/0120/65/000/004/0051/0054

539.1.074.822.3:539.172.8

AUTHOR: Malov, M. M.; Melikov, Yu. V.; Tulinov, A. F.

TITLE: Use of a proportional counter for spectrometry of nuclear reaction products

SOURCE: Pribory i tekhnika eksperimenta, no. 4, 1965, 51-54

TOPIC TAGS: proportional counter, spectrometry, alpha spectroscopy, particle counter, particle accelerator, particle scatter

ABSTRACT: The design and operation of a proportional counter for the spectrometry of products of nuclear reactions are described. The main characteristics of the counter were studied by means of an α-particle source (Cm242). The gas amplification factor (g.a.f.) is determined as a function of the voltage of the anode filament at various pressures of the gas mixture (argon $+$ CO_2 admixtures) of the counter and at a constant CO_2 content (3.5%), and the resolution of the counter was determined as a function of the CO_2 content at a constant g.a.f. (equal to 10). The study shows that the critical value of g.a.f. $>$ 100, and the resolution is 1.5% when $E\alpha = 6.1$ MZV. In addition to studies with the α preparation, the counter was also used for recording the products of scattering of 26 MEV α particles

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L 00070-66
ACCESSION NR: AP5021329

accelerated by a cyclotron. The resolution of the counter in these measurements is 1.6—2.5%. Orig. art. has: 5 figures.

ASSOCIATION: Nauchno-issledovatel'skiy institut yadernoy fiziki, MGU (Scientific Research Institute of Nuclear Physics, MGU)

SUBMITTED: 08Jun64   ENCL: 00   SUB CODE: NP

NO REF SOV: 002   OTHER: 004

Card 2/2

BALASHOV, V.V.; BOYARKINA, A.N.; TULINOV, A.F.

Effect of the excited states of an intermediate nucleus on the reactions
of cluster substitution. Izv. AN SSSR, Ser. fiz. 29 no.7:1160-1165 Jl
'65.
                                                 (MIRA 18:7)

L 13814-66   EWT(m)/T

ACC NR: AP6001667   SOURCE CODE: UR/0053/65/087/004/0585/0598

AUTHOR: Tulinov, A. F.

ORG: none

TITLE: Influence of the crystal lattice on some atomic and nuclear processes

SOURCE: Uspekhi fizicheskikh nauk, v. 87, no. 4, 1965, 585-598

TOPIC TAGS: crystal lattice structure, particle interaction, fast particle, nuclear reaction, alpha decay, charged particle, particle motion

ABSTRACT: This is a review article dealing with the influence of the lattice on the nature of motion of fast particles in a crystalline medium. This study includes an analysis of problems connected with the motion of particles introduced into a crystalline sample from the outside, as well as problems involving particles generated in the crystal itself, particularly those emerging directly from the lattice sites. Only the motion of charged particles is considered. In the

Card   1/3   UDC: 548.3 + 539.1

L 15814-66

ACC NR: AP6001667   O

case of particles incident on a single crystal from the outside,
special attention is paid to the channeling of the captured particles
inside a crystal, the distribution of the electrons belonging to dif-
ferent atomic shells within the channel, the decrease in the proba-
bility of reactions caused by the channels particles, and the reduc-
tion in the energy lost by the particles, and the yield of character-
istic x rays resulting from such reactions. In the case of charged
particles which are products of nuclear reactions and interact with
the lattice, the emphasis is on the shadow effect wherein certain
directions along the crystallographic axes are closed to particles
leaving the lattice sites so that characteristic shadows can be ob-
served along these directions. The reports of a detailed study of
this effect by the author (with V. S. Kulikauskas and M. M. Malov,
Phys. Lets. v. 18, 304, 1965) are reported in detail. Possible
applications of the shadow effect to determine the duration of nuclear
reactions and to investigate some properties of crystals, as well as
in investigations of the alpha decay of nuclei introduced in the
crystal lattice are described. The use of shadow patterns connected
with the presence of numerous crystallographic directions for the

Card   2/3

L 15814-66
ACC NR: AP60 1667   O

study of crystalline structure is described. Desired trends in
future research are indicated. Orig. art. has: 14 figures, 3
formulas, and 2 tables.

SUB CODE: 20/   ORIG REF: 006/   OTH REF: 016

Card   3/3

L 22837-66   EWT(m)/EWA(h)

ACC NR: AP6003828

SOURCE CODE: UR/0386/65/002/003/0120/0122

AUTHOR: Dolinov, V. K.; Melikov, Yu. V.; Tulinov, A. F.

ORG: Research Institute of Nuclear Physics of the Moscow State University im. M. V. Lomonosov (Nauchno-issledovatel'skiy institut yadernoy fiziki Moskovskogo gosu-darstvennogo universiteta)

TITLE: Angular distributions of α particles from the reactions $C^{12}(d, \alpha)B^{10}$ and $O^{16}(d, \alpha)N^{14}$

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 2, no. 3, 1965, 120-122

TOPIC TAGS: carbon, boron, oxygen, nitrogen, Alpha particle reaction, deuteron bombardment, angular distribution

ABSTRACT: As part of a study of nucleon clusters in light nuclei, the authors used deuterons accelerated to 12.4 Mev in a cyclotron to determine the angular distribution of the α particles from the reactions $C^{12}(d, \alpha)B^{10}$ and $O^{16}(d, \alpha)N^{14}$ at two values of the deuteron energy, 12.4 and 11.4 Mev. The target for the first reaction was a carbon film 130 $\mu g/cm^2$ thick, and for the second a lavsan film 890 $\mu g/cm^2$ thick. The particles were registered with silicon surface-barrier detectors. The

Card 1/2

L 22837-66

ACC NR: AP6003828

angle between detector and deuteron beam could be varied from 10 to 165°. Plots of the angular distributions of the particles from the reactions are presented. The characteristic peculiarities of the angular distributions and the relatively weak dependence of the distribution on the deuteron energy indicated that the direct interaction plays a predominant role. The data are presently the subject of a theoretical analysis from the point of view of various direct-reaction mechanisms.

Orig. art. has: 2 figures.

SUB CODE: 20/   SUBM DATE: 04Jun65

Card 2/2 W

L 39727-66   EWP(t)/EWA(h)/EWT(m)   JD/JG/GD-2
ACC NR: AP6007175   SOURCE CODE: UR/0188/66/000/001/0081/0084

AUTHORS: Vavilov, V. S.; Golovina, N. V.; Iferov, G. A.;
Tulinov, A. F.; Chukichev, M. V.

ORG: NIIYaF MGU

TITLE: Use of semiconductor counters of the p-i-n type to study
nuclear reactions

SOURCE: Moscow. Universitet. Vestnik. Seriya III. Fizika,
astronomiya, no. 1, 1966, 81-84

TOPIC TAGS: junction diode, semiconductor device, crystal counter,
silicon, alpha particle reaction

ABSTRACT: The authors describe a procedure for preparing p-i-n
junction counters. The procedure is based on the drift of lithium
ions in silicon. The counters obtained in this manner were used to
investigate nuclear reactions induced by α particles accelerated to
26 Mev at the cyclotron of NIIYaF MGU. Zone-melted silicon with
resistivity 450 -- 800 ohm-cm was used as the initial material. Lith-

Card   1/2   UDC: 539.1.074

L 39727-66
ACC NR: AP6007175   3

ium was deposited on its surface by vacuum sputtering and allowed to
diffuse at 450 -- 500C to a depth $\sim$ 100 μ. The ion drift was produced
in silicone oil at 120C and an inverse voltage of 300 V. The resolv-
ing power of the counters was determined by measuring the spectrum of
α particles from a Cm^{242} source, and was found to range from 0.9 --
1.5%. The counters were used to investigate elastic and inelastic
scattering of 26.3 Mev α particles by carbon nuclei. The tests have
shown that the excitation functions plotted at fixed angles exhibited
as a rule sharply pronounced nonmonotonicity, probably due to the
appearance of some individual levels or groups of levels in the com-
pound nucleus. The experimental data obtained were used to construct
the angular distributions at different energies of the incident
particles. These were found to agree with theory at small angles and
exhibited a regular tendency for an increase in the differential cross
section at large angles. No agreement was observed at medium angles.
The results agree with the calculations based on the adiabatic model
only at small angles. The authors thank I. B. Teplov, P. Matyya, and
V. A. Kozlov for help during the work. Orig. art. has: 6 figures.

SUB CODE: 20/ SUBM DATE: 19Sep64/ OTH REF: 004

     Card 2 5 2/2

L 24393-66   EWT(1)/EWT(m)   D
ACC NR: AP6010979   SOURCE CODE: UR/0056/66/050/003/0589/0594

AUTHORS: Bednyakov, A. A.; Nikolayev, V. S.; Rudchenko, A. V.; 4/9
Tulinov, A. F.   B

ORG: Institute of Nuclear Physics, Moscow State University
(Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta)

TITLE: Multiple scattering of nitrogen and oxygen ions in aluminum

TOPIC TAGS: oxygen, nitrogen, aluminum, multiple scattering,
angular distribution, ion interaction

ABSTRACT: The authors use a system of proportional counters to measure
the angular distribution of N^{14} and O^{16} ions with initial energy ~ 0.3
MeV/nucleon after multiple scattering in aluminum foils. The meas-
urements were made with a 72-cm cyclotron, using essentially a tech-
nique previously developed for a study of equilibrium distributions

Card   1/3   2

L 24393-66
ACC NR: AP6010979
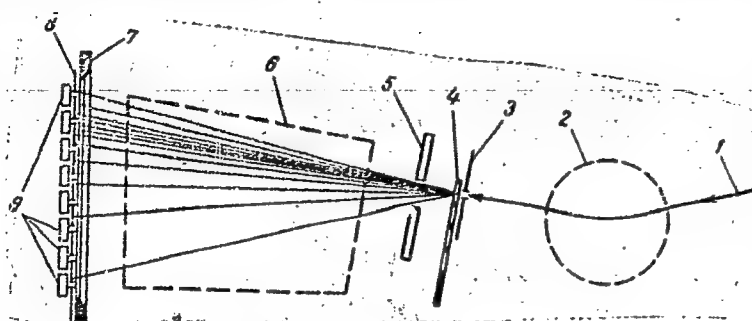
Fig. 1. Experimental setup. 1 -- Ion beam, 2 - magnetic mass monochromator, 3 - diaphragm, 4 - scattering target, 5 - movable channel, 6 - magnetic analyzer, 7 - slit, 8 - movable slits, 9 - proportional counters.

of charges in ion beams (ZhETF v. 39, 905, 1960 and earlier papers) (Fig. 1). In addition to measuring the angular distributions, the authors measured the charge composition of the beam of ion scattered at angles up to $\pm 1.5^{\circ}$. The angular distributions obtained were analyzed on the basis of the Moliere-Bethe theory (Phys. Rev. v. 89, 1256, 1953), developed for scattering of fast charged particles by

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L 24393-66
ACC NR: AP6010979   0

atoms described by a statistical model. Although the theory is
imcomplete in that it does not show the dependence on the particle
charge, the experimental angular distributions agree satisfactorily
with the theoretical distributions if one uses for the charge of the
moving ion the rms charge of the ions in a beam of equilibrium
charge composition. Orig. art. has: 3 figures and 5 formulas.

SUB CODE: SUBM DATE: 22Oct65/ ORIG REF: 004/ OTH REF: 004

Card   3/3 OLR

AUTHOR: Akhmetova, B. G.; Plets, Yu. M.; Tulinov, A. F.

ORG: Institute of Nuclear Physics, Moscow State University (Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta)

TITLE: Scattering of 5 - 40 kev protons by molybdenum single crystals

ABSTRACT: The authors report an investigation of the shadows observed on photographs obtained in tests of scattering of charged particles by single-crystal targets; these shadows are due to the Coulomb interaction of the scattered particles with the ordered nuclei of the lattice. The scattered protons had an energy 5 - 40 kev and the scattering crystal was molybdenum. The measurements were made with the electromagnetic separator of the Nuclear Physics Research Institute of the Moscow State University. The results showed that the contrast of the shadow patterns decreased in the energy region 5 - 15 kev, probably owing to surface contamination. The sharpest patterns were obtained for the highest energies. In addition, measurements were made at 300, 500, and 900K to determine the temperature dependence of the effect. An increase in the temperature led to a decrease in the depth of the shadow, as was observed in earlier investigations (Phys. Lett. v. 18, 304, 1965). The authors thank Yu. D.

Card   1/2

ACC NR: AP7003205

Chistyakov and A. I. Pekarev for preparing the molybdenum crystals, and L. N. Isayev for assistance in the experiment. Orig. art. has: 4 figures.

SUB CODE: 20/   SUBM DATE: 05Jul66/   ORIG REF: 005/   OTH REF: 003

Card   2/2

TULINOV, A.N., CHARAKHCHYAN, T.N. And CHARAKHCHYAN, A.N.

"Increase of Cosmic Ray Intensity in the Stratosphere in November, 1960."

report presented at the Intl. Conference on Cosmic Rays and Earth Storms, Kyoto, Japan, 4-15 Sept. 1961.

TULINOV, B.A.

Science

Arithmetic (for non-pedagogic colleges), Izd. 3. Moskva, Uchpedgiz, 1951

TULINOV, Boris Alekseyevich; CHEKMAREV, Yakov Fedorovich; DOLGOPOLOV, V.G.,
    red.; KOVALENKO, V.L., tekhn.red.

    [Arithmetic for pedagogical schools] Arifmetika; dlia pedagogicheskikh
    uchilishch. Izd.6. Moskva, Gos.uchebno-pedagog.izd-vo M-va prosv.
    RSFSR, 1961. 295 p.
                            (Arithmetic)   (MIRA 14:6)

TULINOV, Boris Alekseyévich; CHEKMAREV, Yakov Fedorovich; SIDOROVA, L.A.,
    redaktor; SHIKIN, S.T., tekhnicheskiy redaktor

[Arithmetic; for pedagogical schools] Arifmetika; dlia pedagogiche-
skikh uchilishch. Izd. 5-oe. Moskva, Gos. uchebno-pedagog. izd-vo
Ministerstva prosveshcheniia RSFSR, 1955. 285 p.   (MLRA 8:7)
    (Arithmetic)

TULINOV, F.

Lessons in the field. Tyl i snab. Sov. Voor. Sil 21 no.11:74-75
N '61.   (MIRA 15:1)
                    (Russia—Army—Fuel)

AUTHOR: ~4019 ~2 IJP(c)

Kolotov, O. S.; Lobanov, Yu. N.; Tulinova, N. I.

ORG: Scientific Research Institute of Nuclear Physics, MGU (Nauchno-issledovatel'skiy institut yadernoy fiziki MGU)

SOURCE CODE: UR/0120/65/000/005/0037,0039

TITLE: Production and registration of short pulses of betatron injector electron current

SOURCE: Pribory i tekhnika eksperimenta, no. 5, 1965, 37-39

TOPIC TAGS: betatron, electron trapping

ABSTRACT: For the study of processes related to the trapping of electrons in the betatron cycle and the subsequent behavior of these electrons during the first turns, pulses are needed which will not interfere with the registration of the previously injected electrons. Best results can be obtained with injectors operating during a part of a full turn time-period and filling a section of the circumference of the chamber with electrons. The necessary time interval is of the order of 10^{-8} to 10^{-9} sec. There are no difficulties in producing nanosecond pulses; however, there are considerable problems present during the design of injectors which without distortion transform voltage pulses into electron current bursts. The article describes such a low-

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UDC: 621.384.634.3

AKIYAMA, Kh. [Akiyama, Hiroshi]; GUSEV, M.A. [translator]; ZLOMANOV,
V.A. [translator]; RYABKIN, A.G. [translator]; TULINOV, M.N.
[translator]; SMIRNOV, P.I., red.; KHOMYAKOV, A.D., tekhn.red.

[Special detachment 731] Osobyi otriad 731. Moskva, Izd-vo
inostr.lit-ry, 1958. 151 p. Translated from the Japanese.
(MIRA 12:8)

(Manchuria--Bacteriological warfare)

SAVEL'YEV, B.A.; TULINOV, R.G.

Basic characteristics of the glaciation in the Malaya
Almatinka Basin. Merzl. issl. no.3:103-111 '63.

Formation of mudflows in the Malaya Almatinka Basin.
Ibid.:112-117   (MIRA 17:6)

L 36121-66   EWT(1)/FCC   GW/GD

ACC NR: AT6006259   SOURCE CODE: UR/0000/65/000/000/0018/0025

AUTHOR: Tulin, V. A.; Havchenko, A. A.

ORG: None

TITLE: A method for the accurate investigation of contact thermometers

SOURCE: AN SSSR. Institut fiziki Zemli. Apparatura i metody morskikh gravimetrich-
eskikh nablyudeniy (Apparatus and methods of marine gravimetric observations).
Moscow, Izd-vo Nauka, 1965, 18-25

TOPIC TAGS: thermometry, test instrumentation, thermometer, thermostat, precision
instrument

ABSTRACT: Accurate operation of precision relay thermometers depends on the ac-
curacy of contact thermometer sensors. The Department of Experimental Gravimetry
of the Institute of Physics of the Earth, AN SSSR (Otdel eksperimental'noy gravi-
metrii Instituta fiziki Zemli AN SSSR) earlier developed the appropriate equipment
(V. A. Tulin, Trudy In-ta fiziki Zemli AN SSSR, No. 31, 1964) for testing contact
thermometer sensors. The purpose of the present article is to discuss some of the
methods related to the investigations and processing of the experimental data.
A description is given of modifications of the original equipment, and of a method
Card 1/2

L 36121-66
ACC NR: AT6006259   0

for the simultaneous testing of 6 thermometers within water-operating thermostats.
Detailed data concerning the operation of the specially designed thermostats are
provided. An analysis of the results shows that the best results are obtained
with thermostats with forced cooling and a liquid (mixable) heat-carrying medium;
the heating and forced cooling must be sufficiently strong to suppress outside
influence. The test thermometers should not be moved relative to the heater, and
several thermometers should be studied simultaneously to avoid systematic effects.
The new device secures a high accuracy (an average quadratic error per measurement
of no more than $\pm 0.003C$). It is noted that it is not the true temperature that is
measured, but only its variations relative to the scale of a standard thermometer.
Orig. art. has: 4 figures.

SUB CODE: 14/ SUBM DATE: 29Oct65/ ORIG REF: 002
         13/

Card 2/2 _llb_

L 35895-66   EWT(1)   GD/GW

ACC NR: AT6006264   (N)   SOURCE CODE: UR/0000/65/000/000/0109/0117

AUTHOR: Tulin, V. A.; Zayonchkovskiy, M. A.

ORG: None

TITLE: A device for the conversion of readings of a marine gravimeter

SOURCE: AN SSSR. Institut fiziki Zemli. Apparatura i metody morskikh gravimetri-cheskikh nablyudeniy (Apparatus and methods of marine gravimetric observations). Moscow, Izd-vo Nauka, 1965, 109-117

TOPIC TAGS: gravimetry, gravimetric analysis, analog digital converter, circuit design , GRAVIMETER

ABSTRACT: The department of experimental gravimetry of the Institute of Earth Physics, AN SSSR (otdel eksperimental'noy gravimetrii Instituta fiziki Zemli AN SSSR) developed a new method for the conversion of signals from gravimeters on mobile supports into digital code. The paper describes the optical-mechanical unit (Fig. 1), outlines the design and operation of electrical circuits (the photo-electric multiplier circuit, the logic key circuit, the ordinate number generator, and the general block diagram), and presents the results of laboratory experiments of the new gravimeter. The device was calibrated using the inclination method since the prototype was too cumbersome for field testing. The error did not exceed 0.7 mgl in any of the instrument ranges. In the experimental work the authors were greatly helped by P. V. Kevlishvili, A. S. Dubovik, A. I. Churbakov, B. V. Vlasov,

Card 1/ 2

L 35895-66

ACC NR: AT6006264

2
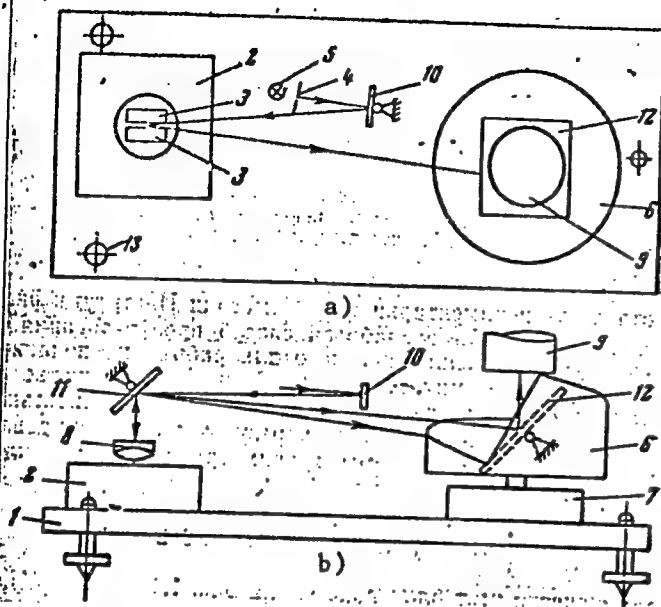
Fig. 1. Diagram of the optical-mechanical unit. 1 - Base plate; 2 - sensor; 3 - mirrors; 4 - diaphragm; 5 - light source; 6 - spiral screen; 7 - motor; 8 - objective; 9 - photoelectric multiplier; 10, 11, and 12 - auxiliary mirrors; 13 - leveling screws

a)

b)

S. G. Tenenbaum, and R. B. Rukavishnikov, to whom they wish to express their deep gratitude. Orig. art. has: 5 figures and 1 table.
Card 2/2 SUB CODE: 08,09/ SUBM DATE: 29Oct65

L 27948-66

ACC NR: AP6017708   SOURCE CODE: UR/0105/66/000/001/0085/0086

AUTHOR: Bertinov, A. I.; Voronetskiy, B. B.; Gendel'man, B. R.; Girshberg, V. V.;
Gromov, V. I.; Druzhinin, N. N.; Kunitskiy, N. P.; Naumenko, I. Ye.; Petrov, I. I.;
Vetrov, G. N.; Rusakov, V. G.; Silayev, E. F.; Slezhanovskiy, O. V.;
Syromyatnikov, I. A.; Tulin, V. S.; Filin, N. M.; Tselikov, A. I.; Chilikin, M. G.;
Yun'kov, M. G.

ORG: none

TITLE: Engineer N. A. Tishchenko (on his 60th birthday)

SOURCE: Elektrichestvo, no. 1, 1966, 85-86

TOPIC TAGS: electric engineering personnel, metallurgic furnace, electric equipment

ABSTRACT: Nikolay Afanas'yevich Tishchenko completed the Khar'kov Electrotechnical
Institute in 1930, after working as an electrician in a Metallurgical plant from
1923-1926. He was active in the development of domestically produced electrical
equipment for rolling mills and metallurgical furnace works. He was active during
WWII in restoring electrical equipment damaged by the Germans. After the war, he
was active in developing electrical drive equipment for both domestic and foreign
metallurgical plants. He has been active in scientific work, publishing over
45 works in such varied fields as electric drives, equipment reliability and
productivity of labor. Orig. art. has: 1 figure. [JPRS]

SUB CODE: 09, 13 / SUBM DATE: none

Card 1/1   BLG   UDC: 621.34

ZHDANOV,,G.B.,,glavnyy red.;;IVANENKO, I.P., zam.glavnogo;red.; ZATSEPIN,
V.I., otv.red.toma; KHRENOV, B.A., zam.red.toma; GERASIMOVA, N.M.,
red.; NIKISHOV, A.I., red.; DORMAN, L.I., red.; TULINOV, V.F.,
red.; SYROVATSKIY, S.I., red.; FEDOROV, V.M., red.; VAVILOV, Yu.N.,
red.; ABROSIMOV, A.T., red.; GUROV, K.P., red.izd-va; BERKGAUT,
V.G., red.izd-va; BRUZGUL', V.V., tekhn.red.

[Extensive air showers and cascade processes] Shirokie atmosfernye
livni i kaskadnye protsessy. Moskva, Izd-vo Akad.nauk SSSR, 1960.
351 p. (Trudy mezhdunarodnoy konferentsii po kosmicheskim lucham,
no.2).   (MIRA 13:12)

1. International Conference of Cosmic Radiation.
              (Cosmic rays)

Tulinov, V. F.

"MEASUREMENT OF COSMIC RAY VARIATION IN THE STRATOSPHERE"
S. N. Vernov, B. E. Samosudov, V. F. Tulinov, A. N. Charakhchian and T. N.
Charakhchian

Beginning with July 1, 1957 (when the ICY programme began) regular measurements
have been made of cosmic ray intensity in the stratosphere at geomagnetic latitudes
of 51°N and 64°N, while since March 1958 similar measurements have been taken also
at geomagnetic latitude of 41°N. The measurements are made with a single G-M counter.
During this period 840 stratosphere observations were made.
    1. The data gathered have helped to establish the existence of a 27-day variation
of cosmic rays in the stratosphere. The shape of the averaged wave is close to
sinusoidal while the period is 27 or 28 days. The wave amplitude, however, changes
more than 5-fold in the observed intervals. The obtained values for the amplitude
of the 27-day variation in the stratosphere are 8 to 10-fold that of similar data
on the Earth.
    2. The existence in the stratosphere of long periodical variations of cosmic
rays of extra-terrestrial origin has been discovered.
    3. Values have been obtained for the cosmic ray latitude effect between latitudes
of 64°N, 51°N and 41°N. It has been ascertained that the latitude effect between
64°N and 51°N undergoes substantial changes with time. The latitude effect between
these latitudes in the maximum of the intensity curve amounts on the average to several
per cent, and goes up abruptly with increase in altitude of observation reaching
15-20% at an altitude of approximately 30 km. Several cases of abnormal increase in

Tulinov, V. F.   (continued)

cosmic ray intensity in the stratosphere at the latitude of 64°N have been discovered.
    4. A correlation between 27-day variations of cosmic retiation and the floccula
on the Sun, and a correlation between the long period cosmic ray variation and Sun
spots has been established.

Report presented at the International Cosmic Ray Conference, Moscow, 6-11 July 1959

TULINOV, V. F.

AUTHOR: Tulinov, V.F.   56-5-15/46

TITLE: A Study of Slow μ-Mesons in the Stratosphere by the Method of Delayed Coincidences (Izucheniye medlennykh μ-mezonov v strato-sfere metodom zapazdyvayushchikh sovpadeniy)

PERIODICAL: Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol 33, Nr 5, pp. 1163-1165 (USSR)

ABSTRACT: A newly constructed apparatus which, by the method of delayed coincidences, is able to prove the forming of slow μ-mesons in the stratosphere, is described in short.
The measured dependence on height of the number of slow μ-mesons for the latitudes 51° and 31° N shows agreement for both measurements. The generation spectrum for 51° N can be represented as follows:

$$\Pi_{51°N}(\mathcal{E}) = \frac{360}{(B+\mathcal{E})^{2.7}} (\mu_o^2)^{-1} \text{min.}^{-1} \text{sterad}^{-1}$$

$B = (2 \pm 0.3) \mu_o^2$, $\mathcal{E}$ = total energy of the μ-meson in units $_o^2$.

Card 1/2

A Study of Slow μ-Mesons in the Stratosphere by the Method of 56-5-15/46
Delayed Coincidences

The following was found for the latitude 31° N:

$$\Pi'_{31^\circ N}(\varepsilon) = \frac{2700}{(12+\varepsilon)^{2.7}} (\mu o^2)^{-1} min.^{-1} sterad^{-1} \text{ for } 2\mu o^2 < \varepsilon < 7\mu o^2$$

and

$$\Pi''_{31^\circ N}(\varepsilon) = \frac{360}{(2+\varepsilon)^{2.7}} (\mu o^2)^{-1} min.^{-1} sterad^{-1} \text{ for } \varepsilon \geqslant 7\mu o^2$$

There are 2 figures and 6 references, 2 of which are Slavic.

ASSOCIATION: Physics Institute imeni P.N.Lebedev, AN USSR (Fizicheskiy
institut im. P.N.Lebedeva AN SSSR)

SUBMITTED: June 3, 1957

Available: Library of Congress

Card 2/2

21(7)

AUTHORS: Vernov, S. N., Corresponding Member,   SOV/2o-122-5-11/56
              Academy of Sciences, USSR, Tulinov, V. F., Charakhch'yan,
              A. N.

TITLE: The 27-Day Variations of the Intensity of Cosmic
              Radiations in the Stratosphere (27-dnevnyye variatsii
              intensivnosti kosmicheskikh luchey v stratosfere)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 122, Nr 5,
              pp 788 - 791 (USSR)

ABSTRACT: The authors carried out a long series of measurements
              of the intensity of cosmic radiation in the strato-
              sphere by means of spherical probes. These
              measurements form part of the program of the Inter-
              national Geophysical Year; they were duly begun
              on July 1, 1957 at two geomagnetic latitudes: 1)
              near Moscow ($\lambda = 51°$, station Dolgoprudnaya, Nauchnaya
              stantsiya Fizicheskogo instituta AN SSSR)(Scientific
              Station of the Physics Institute AS USSR) and 2)

Card 1/4   near Murmansk ($\lambda = 64°$, station Loparskaya, Severnaya

The 27-Day Variations of the Intensity of Cosmic   SOV/2o-122-5-11/56
Radiations in the Stratosphere

Nauchnaya Stantsiya AN SSSR (Northern Scientific
Station AS USSR)). The present paper gives some
results obtained by measurements carried out at
the latitude of 51° from July 1, 1957 to February 1, 1958,
and at the latitude of 64° from July 1, 1957 to
October 1, 1957. These measurements were carried out
by means of the radiometeorograph RK-1, which
contained a thin-walled self-quenched counter of the
type STS-6. The pulses of this counter were trans-
mitted by means of a radio-transmitter. A short
report is made on the measurements of the height
and on the gauging of the counters. The authors
describe the results relating to the maximum of the
intensity curve in the pressure interval of 50-90
g/cm^2. These results, which are shown by a di gram,
seem to indicate a periodicity in the variations
of the intensity of cosmic radiation in the strato-
sphere, viz. for both of the aforementioned latitudes.
In the stratosphere the amplitude of the wave is
Card 2/4   from 8 to 10 times as gre t as the amplitude of the

The 27-Day Variations of the Intensity of Cosmic   SOV/20-122-5-11/56
Radiations in the Stratosphere

wave on sea level. Therefore the variations investigated
are to a great extent caused by the primary cosmic particles
of low energies. According to the data available for
magnetic storms there is not in every case a connection
between the variation of the intensity of cosmic
radiation and the existence of magnetic storms. A
semiperiod of the aforementioned variations lasted
14.3 ± 1 days. Next, a procedure for the more exact
determination of this period is discussed. The authors
thank P.N.Ageshin, V.V.Bayarevich, A.G.Bednyakov,
V.A.Gladyshev, A.M.Istratova, A.F.Krasotkin, Yu.N.
Komarov, F.Kh.Mochakov, I.K.Marshanov, and G.V. Chur-
banova for preparing the apparatus and for carrying out
the experiments; they further thank Ye.S.Glokova. L.I.
Dorman, and A.Ye.Chudakov for their discuss.ng the
results obtained .. There are 3 figures and 5 refer-
ences, 2 of which are Soviet.

Card 3/4

The 27-Day Variations of the Intensity of Cosmic   SOV/2o-122-5-11/56
Radiations in the Stratosphere

ASSOCIATION: Fizicheskiy institut im. P.N.Lebedeva Akademii nauk SSSR
           (Physics Institute imeni P.N.Lebedev of the Academy
           of Sciences USSR)

SUBMITTED: May 24, 1958

Card 4/4

VERNOV, S.N.; TULINOV, V.F.; CHARAKHCH'YAN, A.N.

Measurement of cosmic ray variations in the stratosphere.
Var. kosm. luch. pod zem., na ur. moria i v strat. no.1:48
'59.   (MIRA 13:2)
                        (Cosmic rays)

21(8)

AUTHORS: Rymko, N. P., Tulinov, V. F., Charakhch'yan, A. N.   SOV/56-36-6-9/66

TITLE: A Case of a Sharp Intensity Increase of Cosmic Radiation in
             the Stratosphere (Sluchay bol'shogo vozrastaniya intensivnosti
             kosmicheskogo izlucheniya v stratosfere)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959,
             Vol 36, Nr 6, pp 1687 - 1689 (USSR)

ABSTRACT: On July 8, 1958 an unusually sharp intensity increase of cosmic
             radiation at high altitudes and a geomagnetic latitude of
             64°N was detected by the Loparskaya station (Severnaya nauchnaya
             stantsiya AN SSSR (Northern Scientific Station AS USSR)).
             Measurements were carried out by means of a Geiger-Mueller
             counter and a radioprobe for cosmic radiation RK-1 (as described
             in reference 1). Figure 1 shows the results of measurements,
             which are compared with the curve obtained by measurements
             carried out on March 1 and July 7. In an altitude of 30 km
             the intensity was double the normal value. Analogous measure-
             ments were carried out by means of the stratospheric probe RK-1
             in the stratosphere on July 8 by the station Dolgoprudnaya
Card 1/3   (near Moscow), nauchnaya stantsiya Fizicheskogo instituta AN SSSR

A Case of a Sharp Intensity Increase of Cosmic Radiation   SOV/56-36-6-9/66
in the Stratosphere

> (Scientific Station of the Physics Institute, AS USSR) and at
> Simenze (Krymskaya nauchnaya stantsiya FIAN (Crimean Scientific
> Station of the FIAN)). The first-mentioned station found values
> which were 8-10% below the normal ones, while Simenze found
> no deviations. The sharp increase of intensity was due to the
> increase of the number of primary particles with energies below
> $1.5.10^9$ ev. The increase of the number of primary particles
> of such low energies was accompanied by an intensity decrease
> in the case of primary particles of medium energies
> $(10^{10} > E > 1.5.10^9$ ev) and by an intensity increase in the case
> of primary particles with energies of more than 10^{10} ev. The
> authors finally thank S. N. Vernov for his interest in this
> investigation and for discussing results, and they also thank
> A. G. Bednyakov for his help in carrying out measurements. There
> are 2 figures and 2 Soviet references.

Card 2/3

A Case of a Sharp Intensity Increase of Cosmic Radiation   SOV/56-36-6-9/66
in the Stratosphere

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR
             (Physics Institute imeni P. N. Lebedev of the Academy of
             Sciences, USSR)

SUBMITTED: January 16, 1959

Card 3/3

ZHDANOV, G.B., glav. red.; IVANENKO, I.P., pom. glav. red.; ZATSEPIN,
V.I., red. toma; KHRENOV, V.A., pom. red. toma; GERASIMOVA,
N.M., red.; NIKISHOV, A.I., red.; DORMAN, L.I., red.; TULINOV,
V.F., red.; SYROVATSKIY, S.I., red.; FEDOROV, V.M., red.;
VAVILOV, Yu.N., red.; ABROSIMOV, A.T., red.

Proceedings of the Moscow Cosmic Ray Conference, July 6-11, 1959. Moscow.
Vol.2. Extensive air showers and cascades process. 1960. 331 p.
(No subject heading)

GERASIMOVA, N.M., otv.red.toma; NIKISHOV, A.I., zamestitel' red.toma;
     ZHDANOV, G.B., glavnyy red.; IVANENKO, I.P., zamestitel' glavnogo
     red.; ZATSEPIN, V.I., red.; KHRENOV, B.A., red.; DORMAN, L.I., red.;
     TULINOV, V.F., red.; SYROVATSKIY, S.I., red.; FEDOROV, V.M., red.;
     VAVILOV, Yu.N., red.; ABROSIMOV, A.T., red.; GUROV, K.P., red.izd-va;
     BRUZGUL', V.V., tekhn.red.

[Transactions of the International Conference on Cosmic Rays] Trudy
Mezhdunarodnoi konferentsii po kosmicheskim lucham. Moskva, Izd-vo
Akad.nauk SSSR. Vol.1. [Nuclear interactions at energies of 10^{11}-10^{14} ev.]
IAdernye vzaimodeistviia pri energiiakh 10^{11}-10^{14} ev. 1960. 335 p.
                                            (MIRA 13:9)
1. Mezhdunarodnaya konferentsiya po kosmicheskim lucham. Moscow, 1959.
               (Nuclear reactions)

ZHDANOV, G.B., glavnyy red.; IVANENKO, I.P., zam.glavnogo red.; DORMAN,
   L.I., otv.red.toma; TULINOV, V.F., zam. redaktora toma; GERASI-
   MOVA, N.M., red.; NIKISHEV, A.I., red.; ZATSEPIN, V.I., red.;
   KHRENOV, B.A., red.; SYROVATSKIY, S.I., red.; FEDOROV, V.M.,
   red.; VAVILOV, Yu.N., red.; ABROSIMOV, A.T., red.; GUS'KOV, G.G.,
   red.izd-va; BRUZGUL', V.V., tekhn.red.

   [Transactions of the International Conference on Cosmic Rays] Trudy
   Mezhdunarodnoi konferentsii po kosmicheskim lucham. Moskva, Izd-vo
   Akad.nauk SSSR. Vol.4. [Variations in the intensity of cosmic rays]
   Variatsii intensivnosti kosmicheskikh luchei. 1960. 362 p.
                                                   (MIRA 13:10)
   1. Mezhdunarodnaya konferentsiya po kosmicheskim lucham. Moscow,
   1959. 2. Magnitnaya laboratoriya AN SSSR, Moskva (for Dorman).
                    (Cosmic rays)